ISSN 1946-1011

Washington State Department of Transportation

# The Hybrid Vehicle and Alternative Fuel Report

October 15, 2012

This report is a summary of articles appearing in popular, business, and technical media referring to the impact of fuel costs and fuel efficiency on vehicle technology, development, and markets. At the end of the report is a list of all articles summarized, with hyperlinks to internet sources where available. Some hyperlinks may require free registration or paid subscriptions to access. *The Hybrid Vehicle and Alternative Fuel Report* (**ISSN: 1946-1011**) is compiled by Thomas L. R. Smith, Ph. D., Economic Analysis Branch of the Budget and Financial Analysis Division, Washington State Department of Transportation. Contact the editor at smithtm@wsdot.wa.gov or (360) 705-7941. Contributions of articles and positive comments about *The Report* are welcome.

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## HYBRIDS

**National Hybrid Sales Data for September 2012:** Hybrid car sales for September were down from the previous month by about 9%, but exceeded September 2011 by almost 98%, Brad Berman's *Hybrid Cars* (October 4, 2012) says. Hybrids were 2.94% of total car sales, just below last month's percentage of 3%. The big news in the numbers is that the various models of Prius did not account for over half the hybrid sales. The three Prius models took 49% of hybrids. The top four hybrids were all Toyotas. The original Prius lift back was number one, the Camry hybrid took the number two slot, then came the two other Prii, with the Chevy Malibu hybrid taking fifth. The Ford C-Max hybrid, which Ford is marketing as a direct competitor to the Prius v, debuted in the top ten, beating the Lexus RX 450h for number nine. With several automakers adding new hybrid models to their lineups, there are a total of 42 hybrid models to choose from. Plug-in cars made some progress in September, with the Chevy Volt taking the lead by selling 49% of the plug-ins. The Prius plug-in took the number two slot, with 28% of plug-in sales. Nissan Leaf was a distant third with 17% of sales. The Tesla S took four, and Toyota's fully electric RAV4 debuted at number five, with a whopping five cars sold. At 5,809 units, plug-ins account for only 0.49% of total auto sales. Earlier, we said Ford is marketing the C-Max as a direct competitor to the Prius v. If you have not seen the Ford commercial, then you may want to take a look at the *Forbes* analysis of Ford's marketing campaign.

*Hybrid Report* subscriber and Volt owner Richard Hanley[1] did some analysis on the Chevrolet Volt's mileage capabilities. First, with a fully charged Volt, the first 35 miles (38 miles on a 2013 model) driven are on electric power. After that, the Volt begins to use gasoline to recharge. Mr. Hanley says that a Volt that travels 43 miles per day gets, in effect, 250 miles per gallon. If you drive the Volt 55 miles per day, it gets the equivalent of 100 mpg. Once you begin driving 135 miles per day, the Volt gets 50 miles per gallon, or the equivalent of a Prius (see Figure 1). Mr. Hanley also cautions that your results may vary depending on weather and driving style. You may also be interested in Volt Stats, a website that collects data from Volts through

[1] Mr. Hanley works for the Department of Transportation of an east coast state. So that Mr. Hanley's analysis will not be construed as an endorsement by that Department, the state will remain nameless.

OnStar. Information on Volt Stats includes the percentage of time Volts spend in electric mode and MPG equivalent.

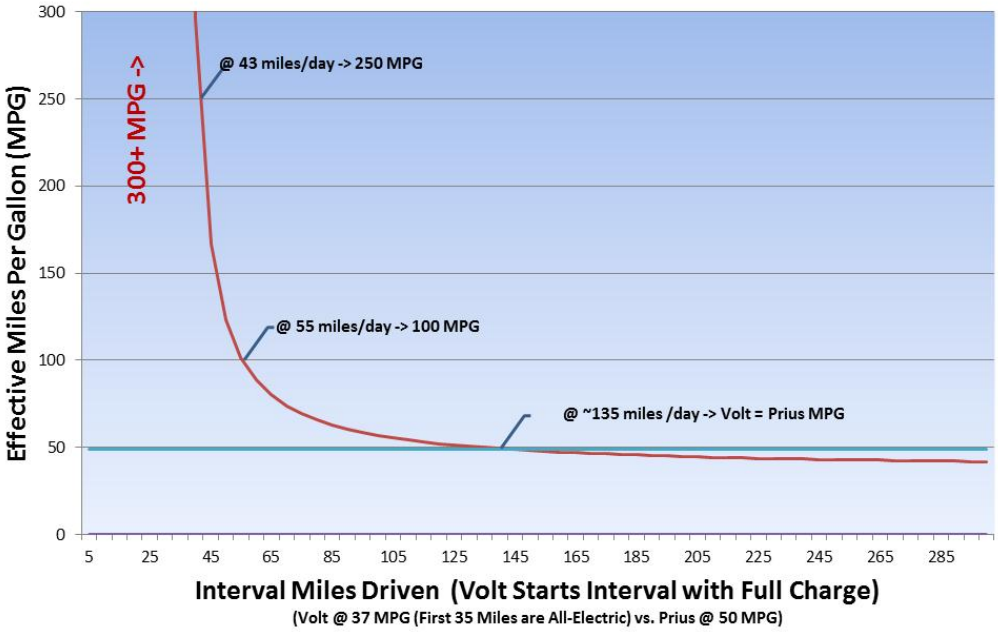


**Figure 1. Effective Miles Per Gallon, Chevrolet Volt at Full Charge vs. Toyota Prius**
© 2012 Richard C. Hanley, P. E.

*The Sunday Times* newspaper in London just gave the Vauxhall Ampera the Best Electric and Hybrid car award, *Fleet Directory* (Simpson, October 8, 2012) relayed. The Ampera is essentially a Volt produced by GM's British subsidiary. The Ampera version gets 50 miles on electricity before shifting to gasoline, while the Volt gets 35. GM sells the Volt under Vauxhall's Ampera badge in the UK and as an Opel Ampera in the rest of Europe. In Australia, the car is a Holden Volt.

UPS is adding twenty hydraulic hybrid delivery trucks to its Baltimore, Maryland, [2] fleet and twenty to its Atlanta, Georgia,[3] fleet, *The Financial* (October 4, 2012) reported. The package delivery truck chassis are made by Freightliner, while the drive system comes from Parker Hannifin Corporation. The trucks get 35% better fuel economy and 30% better (less) carbon dioxide emissions than diesel trucks.

The automotive marketing company Jumpstart Automotive Group (October 10, 2012) released national internet car shopping data that may not surprise anyone. Jumpstart's survey of 14 automotive shopping sites revealed that "people living in the Northwest represent the highest concentration of hybrid car shoppers in any territory of the U.S." Jumpstart defines the Northwest

[2] The editor entered the US Navy at the Armed Forces Entrance and Examination Station in Baltimore in 1976. The Navy celebrated its 237th anniversary on October 13th. Two hundred thirty-seven years of tradition unhampered by progress.
[3] The editor's former home town, 1961-1972.

as the states of Alaska, Washington, Oregon, Idaho, Montana, and Wyoming. Southwestern shoppers tend to look for compacts, those in the North Central states look for sedans and SUVS, South Central internet shoppers are interested in trucks, and East Coasters look for luxury cars.

## ALTERNATIVE FUELS

Korea's Hyundai will take a pass on the electric vehicle segment and compete in the hydrogen fuel-cell sector instead, *Energy & Capital* (Chakravorty, September 27, 2012) says. Hyundai introduced a production model at the Paris auto show last month. Fuel-cell vehicles use the conversion of hydrogen into water to generate electricity to power electric motors, rather than batteries. Refueling takes about the same amount of time as filling the gas tanks on internal combustion engine cars.

***Pardonnez-moi s'il vous plait:*** [4] A French biofuel plant that uses factory seconds from the nearby M&M/Mars plant may be the reason French honey bees are producing blue and green honey, the *BBC* (October 4, 2012a) reported. French beekeepers noticed colored honey at the same time that Agrivalor, the biofuel company, noticed bees were raiding the feed stock stored outside. The fuel company has taken steps to seal the colored candy, which may be coloring the honey. Beekeepers say they cannot sell the multi-colored honey.

**If it isn't one thing, it's the other**: The European Union (EU) has decided to eliminate biofuel subsidies paid to farmers who grow corn and wheat used in biofuel, *Deutsche Welle* (Skyring, October 10, 2012) reported. The EU is also eliminating its biofuel content requirement of 10% because of the supposed pressure on food prices. Farmers are not happy and Agrana, a major biofuel producer believes that the old standards are achievable using excess agricultural production. To meet EU fuel demand, the EU plans to turn to non-food biofuel sources like logging residue and waste products. Greenpeace criticizes this plan, however because many of the waste products the EU recommends using have an important function in the ecosystem.

## ELECTRIC VEHICLES

**Gone to a Better Place**: The big news in the electric vehicle world was the ouster of Better Place founder Shai Agassi. First, the Better Place board of directors fired Mr. Agassi as CEO on October 2 (Woody, *Forbes*, October 2, 2010), however he was to remain on the board of the company. That changed on the tenth of October, when Mr. Agassi announced his resignation form the board, the Israeli business news source *Globes* (October 10, 2012) reported. Better Place's business model is to create electric car battery swapping stations, which takes minutes to do, rather than have electric car drivers wait hours for a charge. Better Place had some success in establishing swapping stations in small test markets, however over runs and project delays, particularly in the company's Israeli program was a key factor in Mr. Agassi's downfall. According to *Forbes*, the company lost $490 million since the company was founded five years ago. The head of Better Place's Australian operation, Evan Thornley, was appointed to replace Mr. Agassi. Prior to founding Better Place, Mr. Agassi was a senior executive of the software giant SAP and a member of its Executive Board.

[4] A rough translation into English: "Oops!"

We generally don't link to new car reviews in the *Hybrid Report*, however, when one of our subscribers writes one, we make an exception. *Hybrid Report* subscriber and electric car enthusiast Jay Donaway describes his experience after his daily use of his Mitsubishi iMiEV, accumulating 10,000 miles over the course of six or seven months. Mr. Donaway says he originally bought the car as a second commuter vehicle, but the car has become the family's car of choice. The review is published in *Inside EVs*.

From time to time we are reminded that early in the automobile's history, gasoline was not the predominant fuel for vehicles. According to the *New York Times*, in 1900, 34% of the cars in the three major metropolitan areas of New York, Boston, and Chicago were electric and the largest vehicle maker in the U. S. was the Electric Vehicle Company (Koerth-Baker, October 2, 2012). The Electric Vehicle Company did not sell the cars it made, but rented or leased them. But if electric cars had a much better market position in 1900, how did it loose out to the gasoline engine? One reason is that the Electric Vehicle Company collapsed due to some shady business deals. After the company went bankrupt, investors avoided electric cars after that and put money into gas instead. *The Charleston (West Virginia) Gazette* also points out the electric starter on gasoline engines that eliminated the need to hand crank engines helped in the demise of the electric car (Steelhammer, October 4, 2012).

**Well, Not Exactly**: The news media is abuzz with articles about a new study from the Norwegian University of Science and Technology published in the *Journal of Industrial Ecology* entitled "Comparative Environmental Life Cycle Assessment of Conventional and Electric Vehicles" (Hawkins, Singh, Majeau-Bettez, & Strømman, October 4, 2012). Most of the headlines of articles describing the research say things like "Electric cars are twice as harmful than[5] conventional cars to the environment during manufacturing" (Pulu, *ZME Science*, October 8, 2012), "Electric cars pollute more than petrol models, says study" (Reid, *Recombu*, October 5, 2012), or "Electric cars 'pose environmental threat'" (*BBC*, October 4, 2012b). Well, that's not exactly what the study says. The study compared "global warming potential" (GWP) of electric and conventional vehicles from manufacture through their lifetime. The study found that a) electric vehicles (EV) using Europe's electricity mix of hydro, coal, and nuclear power reduces GWP compared to conventional vehicles by 10 to 24% during EVs operational life; b) heavy metals used in EV manufacture reduce that advantage; c) EVs *may* have more GWP than conventional vehicles *during the manufacturing stage*, but will still be less than those vehicle during their lifetime; d) the longer the EV is used, the better its impact; and e) the source of energy used during manufacture and operation makes a big difference how clean an EV is.

Needless to say, the electric car manufacturers (when we say manufacturers, we mean one) are commenting about the study. A spokesperson for Nissan told England's *The Northern Echo* that the report "was highly misleading" (Richardson, October 6, 2012). The spokesperson goes on to explain why the report is misleading, but in doing so, essentially covers information and conclusions discussed in the report. Our point is the report, itself, is not misleading. What is misleading is certain reporters taking a single sentence from the report and running amok with it. [6]

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[5] If we were nit-picking, we would point out that the headline should be "twice as harmful as" or "more harmful than." But we make our share of grammatical errors.

[6] We remind you that the opinion expressed by the editor of this report is not necessarily the opinion of the Washington State Department of Transportation.

## COMING TO A LOCATION NEAR YOU

**United States:** San Diego plans to add 117 charging stations at city facilities by the end of the year that city's CBS affiliate, *KFMB-TV* (October 2, 2012), reported. San Diegans will pay 50 cents per kilowatt hour for charging. We have no idea what that ends up to be in real money. San Diego has about 1,900 electric vehicles on the road.

Oak Ridge, Tennessee, will get ten level 2 Blink chargers, the City (October 4, 2012) said in a press release. The chargers, available by November, will be installed at five popular locations around the city. The City of Oak Ridge will cover the costs of electricity.

**Around the World**: Readers of *The Hybrid Report* are familiar that in this section of *The Report* we list where the latest car chargers are being installed. Most installations seem to be in city centers and shopping malls. That's the wrong approach says Dale Vince, founder of the United Kingdom's Ecotricity (Gray, *The Telegraph*, September 30, 2012). These places are close to home and well within the range of electric vehicles. The issue with electric cars is their range on the open road, so Mr. Vince is working with Nissan in England to bring fast chargers to every freeway service station in the country.

InterContinental Hotels Group will install Better Place charging facilities at five properties in New South Wales, Australia, *The Sydney Morning Herald* (Hannam,) heralded on the morning of October 3, 2012. The hotel chain already has Better Place chargers at properties in Canberra and Melbourne.

## OTHER TECHNOLOGY

All of the fuel-saving technology we discuss in this *Report*, hybrid and electric cars, alternative fuels and alternative fuel vehicles, and various gas-saving gizmos, may be of no avail because of one little problem Allstate Insurance points out: as vehicle makers make more fuel efficient vehicles, the Americans who ride in them weigh more. According to the *Seattle Post-Intelligencer* (Sebastian, October 8, 2012), 1 billion gallons of gas were burned between 1960 and 2002 in the U. S. because of increased passenger weight. Americans weigh about 20 pounds more today than they did in 1990. Every 100 pounds of added weight reduces fuel efficiency by 2% or one mile per gallon.

Speaking of weight, a development at University of California, San Diego may allow electric and hybrid vehicles to shed 25% of their lithium ion battery weight, *Automotive News Europe* (Bond Jr., October 10, 2012) reported. An issue with lithium batteries is that it is difficult to estimate the state of charge within the battery. To ensure there is enough power, manufacturers err on the safe side and beef up battery packs with extra batteries. Professor Miroslav Krstic and Dr. Scott Moura have developed new, more accurate algorithms to estimate battery charge, thus reducing the size of battery banks required in vehicles.

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***That is all.***